

Health Consultation
Booker Landfill
Old Acres Homes/Ella Park Terrace
Houston, Harris County
CERCLIS NO. TXN000605565
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Prepared by
The Texas Department of Health
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

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Summary and Statement of Issues

In August 2003 the U.S. Environmental Protection Agency (EPA) Region 6 asked the Agency for Toxic Substances and Disease Registry (ATSDR) and the Texas Department of Health, Environmental Epidemiology and Toxicology Division (TDH) to evaluate environmental data from samples that characterized contaminants found on the Booker/West Donovan Landfill site, and the residential yards near the site. The Booker Landfill and surrounding subdivisions are in the north-northwest part of Houston, Harris County, Texas. The EPA collected and analyzed surface soil samples in the fall of 2003. TDH assessors were then tasked to determine if exposure to contaminants in surface soil on or off the landfill would pose a public health hazard to community residents.

The residents of the Acres Homes community are concerned that the Booker site may pose a significant threat to their health. Community representatives suggest that residents are increasingly reporting cancer and other unusual diseases.

TDH has determined that exposure to chemicals in surface soil at the Booker Landfill in residential yards or the ditch between the landfill and yards poses no apparent public health hazard. Additionally, the TDH Cancer Registry Division found no significant elevations in the rate of cancer or numbers of deaths from cancer.

Background

Site Description and History

The Old Booker Landfill and surrounding subdivisions are in the northwest part of Houston, Harris County, Texas. The primary 25 acre site is bordered by residences on West Donovan Road on the south, and by West Tidwell Road on the north. The west side of the landfill is bounded by Rosslyn Road and the east side is bounded by Wheatley Street. The landfill was an old (operated during the late 1960s and early 1970s), non-permitted solid waste facility located in the Acres Home subdivision. The landfill property is accessible to the public (i.e., not fenced) and has been built eight to 10 feet higher than the surrounding properties. There is a low area between the landfill property and the backyards of the residential properties on West Donovan Road (Charles Roosevelt, City of Houston, Department of Health and Human Services, Bureau of Public Health Engineering, personal communication, 2003; Bill Rhotenberry, Superfund Division, Region 6- US EPA, personal communication, 2003). Residents along the north side of West Donovan have reported runoff water and substances seeping from the site into their backyards. Poor drainage in the area aggravates the problem of standing water. Residents are concerned that they may be exposed to unknown hazardous substances from runoff originating on the adjacent landfill site [1–3].

In the spring of 2003 concerned community members from the Old Acres Homes Council, Inc., through a grant from EPA, hired a consulting firm to perform a limited assessment of pollution affecting properties south of the Booker Landfill. Upon completion of the investigation for the Council, the consultant, Quantum Environmental Consultants, Inc., reported that “it is not comprehensible whether the contamination at the subject property is due to offsite surface migration from the former landfill property” [4].

As a follow up to the consultant's report, the Houston Department of Health and Human Services (HDHHS) and the Texas Commission on Environmental Quality (TCEQ) collaborated in further site assessment. From May to August 2003, the combined agencies

- performed visual inspections of the landfill and surrounding properties,
- reviewed existing environmental documents and aerial photos,
- completed borings to help determine landfill characteristics,
- collected soil, groundwater, and drinking water samples, and
- analyzed the samples for metals and organic pollutants.

The HDHHS review of the results, from the tested environmental media, determined that soil, groundwater, and drinking water concentrations were under the applicable EPA/TCEQ standards [3, 10].

Community Health Concerns

The residents of the Acres Homes subdivision are concerned that “an excess number of residents have died of cancer,” so the “community perceives that this site [Booker Landfill] is a significant threat to their health” [2]. Reportedly, fifteen residents on the “same side of West Donovan, all [of] whose yards also abut the landfill, some have either been diagnosed with or have died of cancer in the last 15 years ” [1].

The TDH Cancer Registry Division examined cancer incidence (1995–2001) and mortality (1992–2001) for the ZIP Code that includes the subdivisions around the Booker Landfill: (77091). No significant elevations in cancer incidence or mortality were found for cancers of the prostate, female breast, lung and bronchus, colon and rectum, male bladder, corpus and uterus, non-Hodgkin's lymphoma, and brain including other nervous tissues (brain/CNS) [5–8].

Discussion

Introduction

The EPA conducted a preliminary assessment of the Booker site in the fall of 2003 [3; Charles Roosevelt, City of Houston, Department of Health and Human Services, Bureau of Public Health Engineering, personal communication, 2003; Bill Rhotenberry, Superfund Division, Region 6-US EPA, personal communication, 2003]. Seventeen surface soil samples (0–6 inches in depth), and three background soil samples were collected and analyzed in October and November of 2003 (Figures 1 and 2). Background samples were collected and analyzed for comparison to residential yard and landfill surface soil measurements. Samples were tested for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), chlorinated pesticides, polychlorinated biphenyls (PCBs), and metals. TDH/ATSDR evaluated the results of the analyses by comparing the detected constituents to health-based, health assessment comparison (HAC) values¹ and by selecting for further consideration pollutants that exceeded HAC values.

¹ To assess the potential health risks associated with the contaminants found in the various media (soil, sediment, or water), TDH compared each contaminant detected with its health-based assessment comparison (HAC) values for non-cancer and cancer endpoints. TDH used either EPA's reference doses (RfDs) or ATSDR's minimal risk levels (MRLs) to derive the non-cancer HAC values. RfDs and MRLs are based on the assumption that there is an identifiable exposure threshold (both for the individual and for populations) below which there are no observable

Environmental Contamination

Contaminants in Residential Yard and Ditch Surface Soil Samples

Seven residential yard and five “ditch” surface soil samples were collected in areas adjacent to the landfill. Chlorinated pesticides and PCBs were not detected above their respective reporting limits. The VOCs acetone (0.170 milligrams per kilogram or mg/kg), methyl ethyl ketone (0.018 mg/kg), and methylene chloride (0.015 mg/kg) were the chemicals found in the highest concentrations for this set of samples. However, laboratory quality review indicates that these VOCs results may be biased because of laboratory or field contamination issues. Low levels of the SVOCs 1,1'-biphenyl (3.4 mg/kg) and bis(2-ethyl hexyl) phthalate (1.1 mg/kg) were measured in two of the residential yards; however, the levels were below health-based screening values. Metals detected in the residential yard and ditch soil samples were below health-based screening values except for arsenic. Arsenic levels were comparable to average soil concentrations for this part of the United States and do not pose a health threat [9].

Contaminants in Landfill Surface Soil Samples

Five surface soil samples were collected from the surface of the landfill property. Low levels of the VOCs acetone (1.8 mg/kg) and methyl ethyl ketone (0.038 mg/kg) were detected, but were also considered biased by quality control review. The SVOC benzo(g,h,i)perylene (0.91 mg/kg) was detected in the soil collected from the landfill surface at a concentration below its health-based screening values. No chlorinated pesticides or PCBs were reported from any of the main landfill samples. Metals measured from this set of samples also were below health-based screening values except for arsenic. Arsenic levels were comparable to average soil concentrations for this region of the United States and do not pose a health threat [9].

Potential Public Health Implications

Residential Yards and Ditch Surface Soil

In all instances the levels of constituents detected in the surface soil samples collected from the residential yards or the low lying ditch between the residential yards and the Booker site either were below HAC values and/or they were comparable to expected soil levels for this region of the United States. Exposure to surface soil from the residential yards or the ditch poses no public health hazard.

Landfill Surface Soil

None of the constituents detected in the surface soil samples collected from the landfill exceeded their respective HAC values or the levels were comparable to expected levels for the region.

adverse effects. Thus, RfDs and MRLs are estimates of daily exposures to contaminants that are unlikely to cause adverse non-cancer health effects even if exposure occurs for a lifetime. The cancer risk comparison values used in this consultation are based on EPA's chemical-specific cancer slope factors (CSFs), an estimate of excess lifetime risk of one cancer in one million (1×10^{-6}) exposed people and an exposure period of 70 years. TDH used standard assumptions for body weight (15 kilograms, child; 70 kilograms, adult) and soil/sediment incidental ingestion rates (200 milligrams per day, child; 100 milligrams per day, adult) to calculate the HAC values.

Health assessment comparison (HAC) values are guidelines that specify levels of chemicals in specific environmental media (soil, air, and water) that are considered safe for human contact. Because many of the assumptions used to calculate HAC values are conservative with respect to protecting public health, exceeding a HAC value does not necessarily mean that adverse health effects will occur. However, exceeding a HAC value does suggest that potential site-specific exposure to the contaminant warrants further consideration.

Using these five surface soil sample results, it is unlikely that any child or adult who might come in contact with surface soil from the landfill site would experience any health problems because of their exposure. Exposure to the landfill surface soil poses no public health hazard.

Children's Health Concerns

ATSDR's Child Health Initiative

TDH and ATSDR recognize that the unique vulnerabilities of infants and children demand special emphasis. Children are at greater risk than are adults from certain kinds of exposures to hazardous substances emitted from waste sites and emergency events. Children are more likely to be exposed because they play outdoors and they often bring food into contaminated areas. They are shorter than adults and they breathe dust, soil, and heavy vapors close to the ground. Children are also smaller than are adults, resulting in higher doses of chemical exposure per unit body weight. The developing body systems of children can sustain permanent damage if toxic exposures occur during critical growth stages. Most importantly, children depend completely on adults for risk identification and management decisions, housing decision, and access to medical care.

In an effort to account for children's unique vulnerabilities, TDH/ATSDR considered the potential exposure to contaminants that children might receive from contaminants in soil from the landfill surface, residential yards, and the low lying ditch between them. Children currently are not likely to be exposed to harmful contaminants from the site. The maximum reported concentration of metals in the surface soil at residences and on the Booker Landfill site were comparable to those of uncontaminated areas.

Conclusions

Given available information, TDH/ATSDR has concluded that:

1. Exposure to the contaminants in the surface soil at the Booker Landfill, the residential yards or the ditch between the landfill and the residential yards poses no apparent public health hazard to children or adults.
2. The TDH Cancer Registry Division examined the available cancer data (1995–2001) for the ZIP Code representing the Acres Homes subdivisions: 77091. For the common cancers of the prostate, female breast, lung and bronchus, colon and rectum, male bladder, corpus and uterus, non-Hodgkin's lymphoma, plus brain including other nervous tissues (as added by the Old Acres Homes Citizens Council), no significant elevations in cancer incidence or mortality were detected.

Public Health Action Plan

Actions Completed

1. The EPA investigators and contractor collected and analyzed surface soil samples from residential yards and the drainage ditch along the southern perimeter of the Booker Landfill.
2. The TDH Cancer Registry Division obtained specific cancers of concern from community representatives, and reanalyzed cancer incidence and mortality using the most current data sets.

3. HDHHS and TCEQ collaborated to assess the site further. From May to August the combined agencies performed visual inspections of the landfill and surrounding properties; reviewed existing environmental documents and aerial photos; completed borings to help determine landfill characteristics; collected soil, groundwater, and drinking water samples; and analyzed the samples for metals and organic pollutants.

Actions Recommended

1. No actions recommended at this time.

Actions Planned

1. TDH/ATSDR plan to provide this report to the community and agencies involved.

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Certification

This public health consultation was prepared by the Texas Department of Health (TDH) under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures that existed at the time the health consultation was initiated.

Technical Project Officer, SPS, SSAB, DHAC, ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this health consultation and concurs with its findings.

Chief, State Programs Section, SSAB, DHAC, ATSDR

References

1. Letter from Congresswoman Sheila Jackson Lee, U S House of Representatives, to Marianne Horinko, Office of Solid Waste and Emergency Response, U S Environmental Protection Agency (US EPA) concerning the Old Booker Landfill and the Old Acres Homes community. June 19, 2003.
2. Letter from Chairman James Smith, Old Acres Homes Citizens Council, Inc. to Bill Rhotenberry, Superfund Division, Region 6, US EPA regarding the “Booker Landfill” in the Acres Homes community. July 25, 2003.
3. City of Houston, Department of Health and Human Services, Bureau of Public Health Engineering. Chronology of activity. November 20, 2003.
4. Quantum Environmental Consultants, Inc. Limited environmental site assessment: portion of Acres Homes Subdivision Adjacent to former W. Donovan Landfill, Project No. H03004. April 6, 2003.
5. Texas Department of Health, Texas Cancer Registry Division, Investigation #04003. Number of observed and expected cancer cases and race adjusted standardized incidence ratios, selected cancers, ZIP Code 77091, Houston, TX, 1995–2000. September 26, 2003.
6. Texas Department of Health, Texas Cancer Registry Division, Investigation #04003. Number of observed and expected cancer deaths and race adjusted standardized mortality ratios, selected cancers, ZIP Code 77091, Houston, TX, 1992–2001. September 26, 2003.
7. Texas Department of Health, Texas Cancer Registry Division, Investigation #04019. Number of observed and expected cancer cases and race adjusted standardized incidence ratios, selected cancers, ZIP Code 77091, Houston, TX, 1995–2001. February 12, 2004.
8. Texas Department of Health, Texas Cancer Registry Division, Investigation #04019. Number of observed and expected cancer deaths and race adjusted standardized mortality ratios, selected cancers, ZIP Code 77091, Houston, TX, 1992–2001. February 12, 2004.
9. Agency for Toxic Substances and Disease Registry. Public health assessment guidance manual. Atlanta: US Department of Health and Human Services; 1993.
10. Houston Department of Health and Human Services. Memorandum from Dr. desVignes-Kendrick, Director to Councilwoman Carol Mims Galloway, Houston City Council concerning Booker Landfill. September 24, 2003.

Appendices

Appendix A: Acronyms and Abbreviations

Appendix B: Figures

Appendix C: Tables

A. Acronyms and Abbreviations

ATSDR	Agency for Toxic Substances and Disease Registry
CREG	Carcinogenic Risk Evaluation Guide
CSF	Cancer Slope Factor
EMEG	Environmental Media Evaluation Guide
EPA	United States Environmental Protection Agency
HAC	Health Assessment Comparison Value
MCL	Maximum Contaminant Level
MRLs	Minimal Risk Levels
PCBs	Polychlorinated Biphenyls
RfD	Reference Dose
RMEG	Reference Dose Media Evaluation Guide
SVOCs	Semi-volatile Organic Compounds
TCEQ	Texas Commission on Environmental Quality
TDH	Texas Department of Health
VOCs	Volatile Organic Compounds

B. Figures

Figure 1- Surface soil sampling sites for residential and corresponding landfill locations

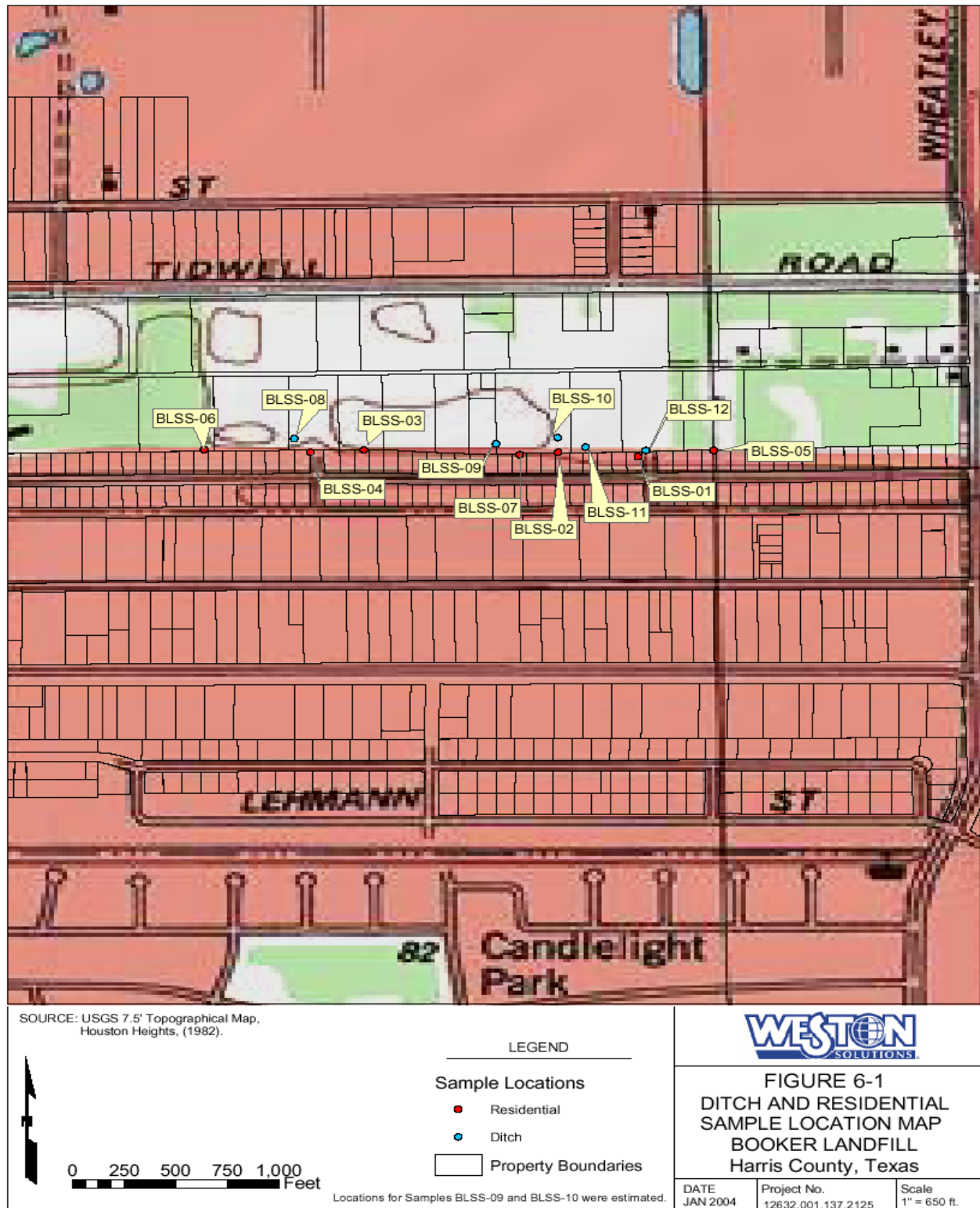
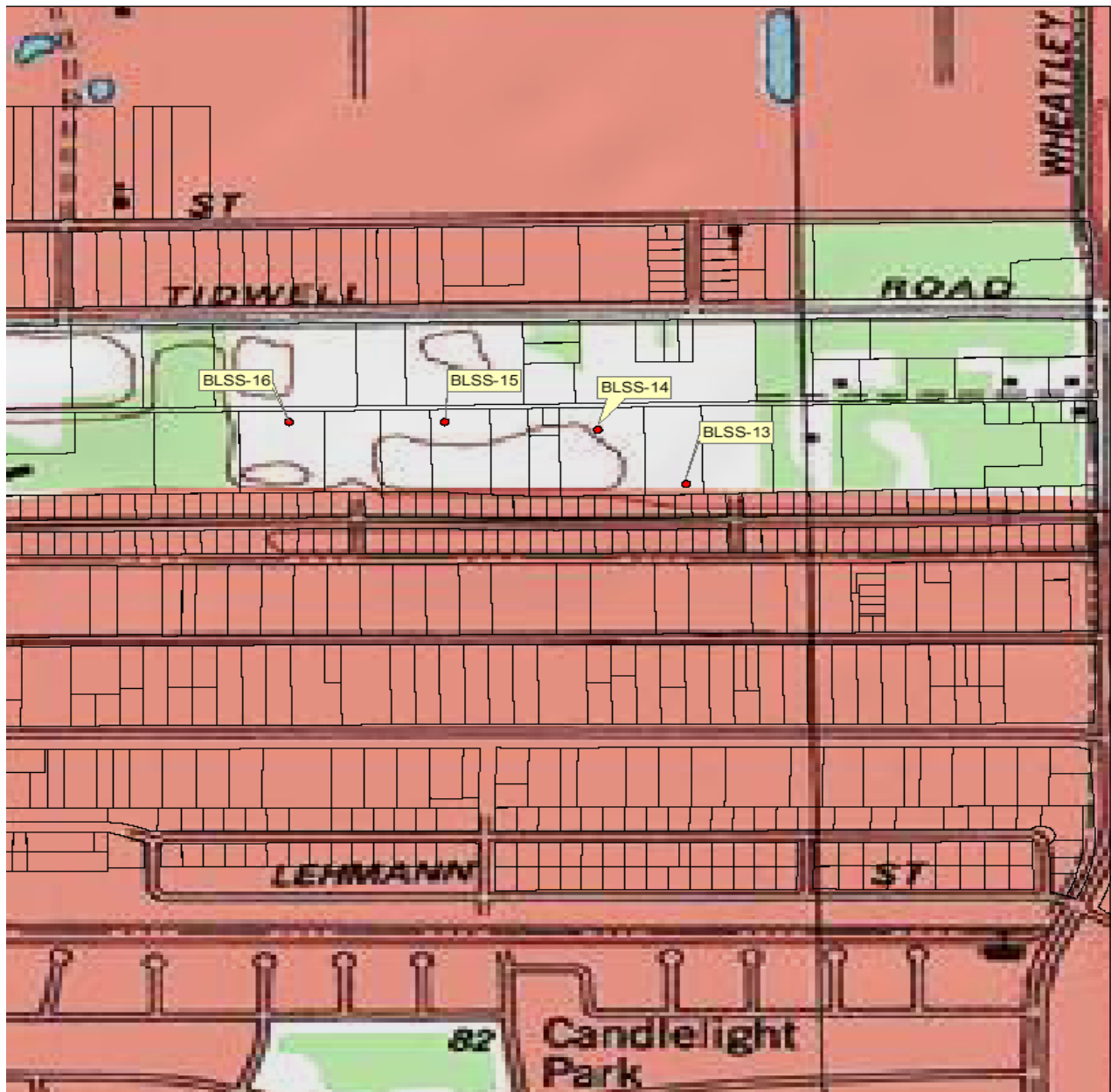


Figure 2- Surface soil sampling sites for landfill locations



SOURCE: USGS 7.5' Topographical Map, Houston Heights, (1982).



0 250 500 750 1,000 Feet

LEGEND

Sample Locations

• Source

□ Property Boundaries



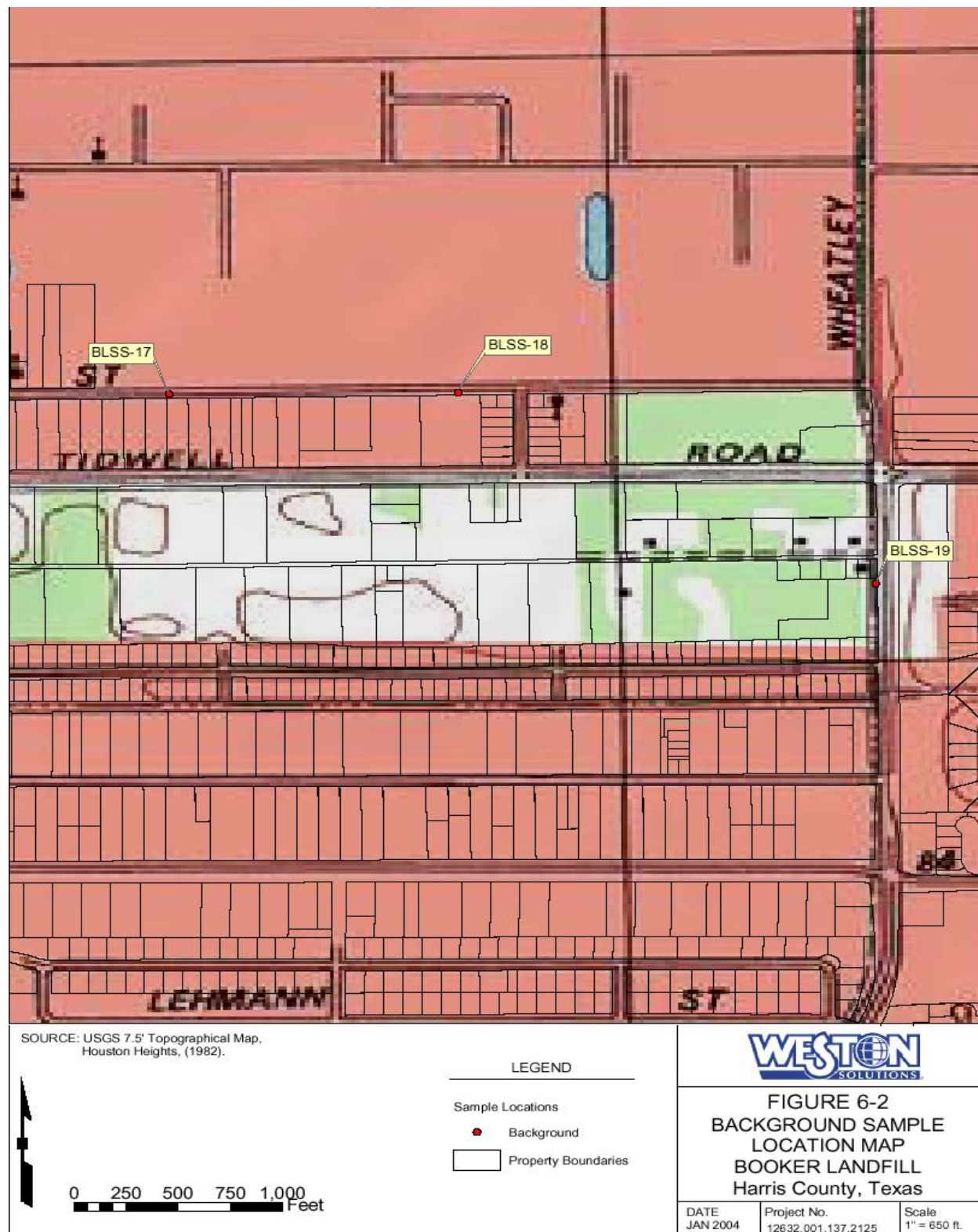
FIGURE 3-1
SOURCE SAMPLE
LOCATION MAP
BOOKER LANDFILL
Harris County, Texas

DATE
JAN 2004

Project No.
12632.001.137.2125

Scale
1" = 650 ft.

Figure 3- Background surface soil sampling sites



C. Tables

Table 1: Residential Soil Samples (0-6 inches) Collected by EPA October 27-28, 2003 in the Vicinity of the Booker Landfill

Residential Yard Samples				
Constituent	Sample ID	Maximum Concentration	HAC Value	Exceeded HAC
Volatile Organic Compounds (mg/kg)				
Acetone	BLSS-01-A	0.170 B	50000/600000 RMEGc/a	No
Methylene chloride	BLSS-01-A	0.015 B	90 CREG; 3000/40000 chrEMEGc/a	No
Methyl ethyl ketone	BLSS-01-A	0.018 B	30000/400000 RMEGc/a	No
Semivolatile Organic Compounds (mg/kg)				
1,1'-Biphenyl	BLSS-02-A	3.4	3000/40000 RMEGc/a	No
Bis(2-ethylhexyl)phthalate	BLSS-02-A	1.1	50 CREG; 1000/10000 RMEGc/a	No
Pesticides/PCBs (mg/kg) none detected above reporting limits				
Metals (mg/kg)				
Aluminum	BLSS-02-A	3210	100000/1000000 intEMEGc/a	No
Arsenic	BLSS-01-A	6.8	0.5 CREG; 20/200 chrEMEGc/a	Yes
Barium	BLSS-02-A	292	4000/50000 RMEGc/a	No
Chromium	BLSS-01-A	24.5	200/2000 RMEGc/a	No
Copper	BLSS-01-A	185	2000/20000 intEMEGc/a	No
Iron	BLSS-01-A	32100	None	Na
Lead	BLSS-02-A	57.7	400 EPA Action Level	No
Manganese	BLSS-02-A	647	3000/40000 RMEGc/a	No
Nickel	BLSS-01-A	62.7	1000/10000 RMEGc/a	No
Vanadium	BLSS-05-A	14.9	200/2000 intEMEGc/a	No
Zinc	BLSS-02-A	538	20000/200000 chrEMEGc/a	No
Ditch Surface Soil (0-6 inches)				
Volatile Organic Compounds (mg/kg)				
Acetone	BLSS-12-A	0.090 B	50000/600000 RMEGc/a	No
Semivolatile Organic Compounds (mg/kg) none detected above reporting limits				
Pesticides/PCBs (mg/kg) none detected above reporting limits				
Metals (mg/kg)				
Aluminum	BLSS-10-A	4020	100000/1000000 intEMEGc/a	No
Arsenic	BLSS-08-A	4.8	0.5 CREG; 20/200 chrEMEGc/a	Yes
Barium	BLSS-12-A	172	4000/50000 RMEGc/a	No
Chromium	BLSS-08-A	12.4	200/2000 RMEGc/a	No
Copper	BLSS-08-A	29.4	2000/20000 intEMEGc/a	No
Iron	BLSS-08-A	13000	None	na
Lead	BLSS-12-A	25.7	400 EPA Action Level	No
Manganese	BLSS-12-A	264	3000/40000 RMEGc/a	No
Nickel	BLSS-09-A	19.4	1000/10000 RMEGc/a	No
Vanadium	BLSS-08-A	16.0	200/2000 intEMEGc/a	No
Zinc	BLSS-08-A	146	20000/200000 chrEMEGc/a	No

B-This result may be high biased because of laboratory/field contamination.

RMEGc/a- Reference dose based media evaluation guide for a child/ for an adult; CREG-Cancer risk evaluation guide;
chrEMEGc/a – chronic environmental media evaluation guide for a child/for an adult

Table 2: Surface Soil Samples from on the Landfill Collected by EPA October 27-28, 2003

Volatile Organic Compounds (mg/kg)				
Constituent	Sample ID	Maximum Concentration	HAC Value	Exceeded HAC
Methyl ethyl ketone	BLSS-14-A	0.038 B	30000/400000 RMEGc/a	No
Acetone	BLSS-14-A	1.8 B	50000/600000 RMEGc/a	No
Semivolatile Organic Compounds (mg/kg)				
Benzo(g,h,i)perylene	BLSS-16-A	0.91	None	na
Pesticides/PCBs (mg/kg) none detected above reporting limits				
Metals (mg/kg)				
Aluminum	BLSS-16-A	4370	100000/1000000 intEMEGc/a	No
Arsenic	BLSS-14-B	4.5	0.5 CREG; 20/200 chrEMEGc/a	Yes
Barium	BLSS-16-A	136	4000/50000 RMEGc/a	No
Chromium	BLSS-16-A	6.5	200/2000 RMEGc/a	No
Copper	BLSS-16-A	9.0	2000/20000 intEMEGc/a	No
Iron	BLSS-16-A	6060	None	na
Lead	BLSS-16-A	27.6	400 EPA Action Level	No
Manganese	BLSS-14-A	412	3000/40000 RMEGc/a	No
Vanadium	BLSS-16-A	16.1	200/2000 intEMEGc/a	No
Zinc	BLSS-16-A	183	20000/200000 chrEMEGc/a	No

B-This result may be high biased because of laboratory/field contamination.

RMEGc/a- Reference dose based media evaluation guide for a child/ for an adult; CREG-Cancer risk evaluation guide;
chrEMEGc/a – chronic environmental media evaluation guide for a child/for an adult